RECD. BOISE NF
RANGERS CIRCULAR
NOV 27 1956
R.S.
AFS
FC
GRAZ.
TIMB.
IMPR.
AA
WHSE.
D-1
D-2
D-3
D-4
D-5
D-6
D-7
D-8
D-9
D-10

612

SPRUCE BUDWORM IN SOUTHERN IDAHO

APPRAISAL SURVEY

August-September 1956

By

Walter E. Cole
Entomologist

INTRODUCTION

To date a total of 1,365,115 acres of Douglas-fir, true fir, and spruce have been sprayed for spruce budworm (Choristoneura fumiferana Clem.) in southern Idaho in Region 4 and on the adjacent Nezperce Forest, Region 1.

During the period from August 9 through September 15, 1956, surveys of budworm damage were conducted in southern Idaho, excluding the area in the 1956 Spruce Budworm Control Project. The purpose of this survey was to locate areas damaged by budworm during the 1956 season, possible reinfestation within areas that were sprayed in 1955, and to evaluate the severity of defoliation.

SURVEY METHODS

For the second year in southern Idaho, aerial and ground appraisal methods have been coordinated to evaluate budworm damage. The sequential plan for sampling budworm damage in southern Idaho was applied in 1955 and from all indications appeared to be a satisfactory method (1). The 1956 appraisal surveys again utilized the sequential sampling plan to confirm the aerial observations and to estimate the degree of intensity of budworm damage.

Aerial Survey Procedure

Aerial surveys must be conducted when discoloration due to damaged foliage is most visible from the air. Only budworm damage of the current year was recorded during aerial observation.

Detection. In order to parallel the appraisal survey terminology, three degrees of intensity of damage were used for sketch-mapping purposes: light, medium, and heavy. The new growth on severely defoliated trees in 1955 appeared as a light green shroud from the air. This was easily distinguishable from any reinfestation within the areas sprayed in 1955.

Flight Pattern. Prior to the flight each forest was divided according to major drainages. These drainages were considered as working areas for easier orientation and plotting of locations of infestation. The major drainage was then flown, working out each minor drainage. In this manner, comprehensive coverage was obtained.

Height of Flight. It was found necessary to fly as low as 400 feet above the tree tops in order to distinguish the damage more accurately. Due to long ferry distances daily takeoff time was around 6:00 a.m. The flight usually ended before noon or when air conditions became unsafe for low altitude mountain flying.

Mapping and Recording. Maps of 1/4-inch scale were used for orientation purposes. An electronic recorder was used for the first time in southern Idaho (2). The intensity of budworm damage and extent of the defoliated area were then recorded on the machine. This audiograph thus made it possible to record more complete, informative observations during flight.

Personnel. The aerial survey crew consisted of W. E. Mineau and W. E. Cole. The majority of the aerial survey was done by Mineau.

Appraisal Survey Procedure

Sampling Method. The sequential plan for sampling budworm damage was used for the second year in southern Idaho. In 1955, a 200 bud (new growth tips) basis was used; in 1956 this basis was changed to 100 buds. It was found that the 100-bud basis is as reliable and less time consuming than the 200-bud basis.

Table 1.--Sequential table for field use.

Tree	Cumulative No. of Defoliated Buds/100 Buds				
	Light-Medium Band		Medium-Heavy Band		
	Light Infestation	Medium Infestation	Medium Infestation	Heavy Infestation	
1	25 - 47		38 - 94		
2	62 - 84		105 - 162		
3	99 - 121		173 - 229		
4	135 - 157		242 - 298		
5	172 - 194		307 - 364		
6	209 - 231		375 - 431		
7	246 - 268		442 - 499		
8	282 - 304		510 - 566		
9	319 - 341		577 - 633		
10	357 - 378		644 - 701		

Technique. One hundred buds were taken from each tree. Hand pruners were used to clip the new-growth tips, thus the survey was limited to the understory. Observations have shown that the understory is defoliated as heavily or heavier than mature trees. Each tree was sampled on four sides, taking 25 buds on each side, thus 100 buds per tree. The number of damaged buds were then counted and recorded. When the number of damaged buds fell outside of either the light-medium band or medium-heavy band the sampling of trees ceased and the intensity of damage was determined as shown in Table 1. In addition to sampling current damage, past damage was also recorded using the three degrees of intensity: light, medium, and heavy. Past damage was visually estimated and recorded as to years of occurrence and intensity.

RESULTS

The appended maps show sample plots and boundaries of defoliated areas. The boundaries of these areas resulted from the combined information obtained from both the aerial and ground surveys, but primarily from the aerial survey. The intensity of defoliation within these areas resulted from either or both ground and aerial surveys. The areas of heavy budworm damage in southern Idaho total approximately 389,900 acres; medium defoliation, 116,650 acres; and light defoliation 145,100 acres. The total acreage of budworm damage is approximately 651,650 acres. One hundred eighty-two sample plots containing 608 trees were taken during the ground appraisal surveys. Of these trees, 88 percent were Douglas-fir; 5 percent, alpine fir; 2 percent, Engelmann spruce; and 5 percent, white fir (Table 3). A total of 98 hours and 15 minutes were flown using a Cessna 182 during the aerial survey (Table 2).

I. Boise National Forest

A total of 25 hours and 50 minutes were required for the aerial survey of the Boise National Forest. The aerial observations and appraisal survey showed only one area of heavy budworm damage of approximately 87,000 acres. A total of 34 sampling plots containing 122 trees were taken on the Boise National Forest. Of these, 85 percent were Douglas-fir; 7 percent, white fir; 8 percent, alpine fir.

B. (see map) Indian Creek.--87,000 acres. This infestation lies between the head of Indian Creek on the west to Norton Ridge on the east, and from the Middle Fork of the Salmon River on the south to the ridge of Gray Peak and Battleax Mountain on the north. This area is separated from the

Big Creek infestation on the Payette National Forest by the main Red Ridge. The center of the infestation, Indian Creek, is of one- or two-year duration and is heavily defoliated. The infestation is of light intensity around Trail and Grays Creek, along Marble Creek, east to Norton Peak and south of Mowitch Creek along Indian Creek. The heaviest defoliation is towards the head of Indian Creek and along the Big Baldy Ridge.

Some reinfestation within the 1954 Pine Butterfly Control Project area and the 1955 Spruce Budworm Control Project areas has occurred. These reinfestations are: (1) Atlanta to Trinity Peak and east of the Middle Fork of the Boise River, (2) between the Sunset-Pilot Peak ridge, (3) Rock Creek between Beaver Creek summit and the South Fork of the Payette River. However, since area 3 was not ground checked, the final development of the budworm population cannot be stated at this time. Examination of the first two areas showed that the majority of larvae died in about the 4th instar from unknown causes.

A small reinfestation occurred along Pine Creek, Warm Spring Creek, and Deer Creek in the Deadwood Reservoir area. The ground examination showed evidence that this budworm population had been greatly reduced by parasites.

A new infestation of about 10,000 acres is located between the head of Hole-in-the-Wall Creek and Wilson Peak bordering the 1955 sprayed area on the west. This area of defoliation is rated as light to medium in intensity.

The Indian Creek area was not sampled due to inaccessibility. The ground survey concentrated on the areas sprayed in 1954 and 1955.

II. Challis National Forest

A total of 14 hours and 30 minutes were required on the aerial surveys of the Challis National Forest. Only one area of budworm defoliation of any consequence was located on the forest. Due to the inaccessibility of this area, no ground survey was attempted. Aerial observations showed this area to be approximately 22,250 acres.

C. (see map) Little Soldier Mountain.--22,250 acres. Defoliation in this infestation is rated as medium. For the most part, the medium defoliation is located at the head of Thomas Creek along the ridge towards Little Soldier Mountain and in Cow Creek. Along the Middle Fork of the Salmon River the budworm infestation is light to medium.

III. Payette National Forest

A total of 14 hours and 15 minutes were required for the aerial surveys of the Payette National Forest. The appraisal surveys and aerial observations show approximately 237,000 acres heavy budworm damage; 27,800 acres of medium damage; and 20,400 acres of light damage--a total of approximately 285,200 acres of budworm defoliation. Thirty-nine sample plots containing 130 trees were taken on the forest. Of these, 65 percent of the trees were Douglas-fir; 16 percent, white fir; 2 percent Engelmann spruce; and 17 percent, alpine fir. The 1955 sprayed area was thoroughly ground checked and large reinfestations were found.

The major infestation of spruce budworm on the Payette National Forest centers in the Big Creek drainage within the Idaho Wilderness Area. There are, however, a few scattered infestations as shown on the attached map.

A. (see map) Big Creek.--237,000 acres. The year of origin of this infestation is not definitely known. It is estimated to have begun in 1950. This area has been reported since 1953 and has steadily increased both in intensity and acreage. The area A_1 (see map), as reported in 1954, contained approximately 87,600 acres of medium to heavy defoliation. Area A_2, approximately 55,400 acres, shows the growth in size as recorded in 1955. The increase in 1956 in Area A_3 is approximately 94,000 acres. In 1955 some top killing of mature trees and scattered dying reproduction were in evidence. In 1956 it is estimated at least 1 percent of the reproduction is dead within the heavily defoliated or original area along the main Big Creek. For the most part, the budworm damage seems to have intensified in a southeasterly direction into the Challis and Salmon National Forests as described in their respective sections.

A_4 Pony Creek.--21,900 acres. This area is in its first year of noticeable defoliation, ranging from light to heavy. The heaviest defoliation lies within the drainage of Pony Creek and lessens in intensity as it radiates towards the boundary.

A_5 Zena Creek.--5,900 acres. The Zena Creek infestation appears to be in its first or second year of defoliation and is of medium to heavy intensity. The center of this localized infestation is on the East Fork of Zena Creek.

A_6. Chicken Creek.--7,000 acres. The budworm infestation within this area is probably in its first year. The intensity of budworm damage is generally light to medium and represents only a localized area.

A_7. Burnt Knob.--13,400 acres. This first year budworm infestation has caused only light defoliation.

IV. Salmon National Forest

A total of 26 hours and 50 minutes flying time were required for the aerial surveys of the Salmon National Forest. The aerial observation and ground appraisal survey showed approximately 37,200 acres of heavy; 31,600 acres of medium; and 41,000 acres of light budworm defoliation or approximately 109,800 acres. There were 18 sample plots containing 54 trees established on the forest. All trees sampled were Douglas-fir.

D. (see map) Bernard Creek.--31,600 acres. This area lies between the Shellrock Peak-Dave Lewis Peak ridge on the west and the Middle Fork of the Salmon River on the east; Sheep Creek on the south to the mouth of Big Creek on the north. The Degree of defoliation varies within this area. There is heavy defoliation in Bernard Creek; medium defoliation in Soldier Creek; and light defoliation in Brush Creek.

E. Stoddard Creek Point.--37,200 acres. This area lies between the Middle Fork of the Salmon River on the east and the Payette National Forest on the west; Twin Peak ridge on the north and the Payette National Forest boundary on the south. Part of this area is heavily defoliated by the spruce budworm and lies fairly close to the Big Creek infestation on the Payette National Forest. There is heavy defoliation in Stoddard Creek, Cradle Creek, and Nugget Creek. Stoddard Creek Point Lookout seems to be the center of the heaviest defoliation. Papoose Creek and Trapper Creek appear lighter in the intensity of defoliation.

F. Square Top Mountain.--41,000 acres. This area lies between Waugh Mountain and West Horse Mountain on the west to Reynold Creek on the east; and from Horse Creek on the south to the forest boundary on the north. There is a light degree of defoliation within this area. The center of infestation appears to be about Bronco Creek.

In addition there are localized areas of light defoliation near Goat Mountain, Carmen Creek, and around Lake Mountain. These areas hardly warrant more than the mention that they do exist.

V. Sawtooth National Forest

A total of 4 hours and 30 minutes were required for the aerial survey of the northern division of the Sawtooth National Forest. There were 25 sample plots containing 80 trees taken on the Sawtooth National Forest. Ninety-five percent of these trees were Douglas-fir and 5 percent, Engelmann spruce. The aerial observations and the ground appraisal surveys show four areas of budworm damage. There are 17,700 acres of heavy defoliation and 53,700 acres of light defoliation. The breakdown and description of these areas is as follows:

G. (see map) Boardman Creek.--17,700 acres. This and the Five Points (J) infestation have existed since 1949, with the intensity of damage fluctuating yearly. Defoliation in 1949 and 1950 was recorded as being light; in 1951, as possibly the lightest year; 1952 as light; 1953, heavy; 1954, medium; 1955, light; and in 1956 the survey crew has recorded it as heavy defoliation. Boardman Creek appears to be the center of the infested area.

H. South Fork of Boise River-Johnson Creek.--40,800 acres. This area, for the most part, could be considered as lightly defoliated. There is one small area of about 500 acres of heavy defoliation at the head of Ross Fork.

I. Snowslide Creek.--10,400 acres. This area is lightly defoliated and hardly noticeable from the air.

J. Five Points.--2,500 acres. The budworm damage in this area is very light in 1956. The infestation, like that of Boardman Creek, has been recorded annually since 1949 and has been fluctuating previously in the same manner as the Boardman Creek infestation.

Due to the history of the trend and fluctuations in intensity of damage in this area, no action should be necessary on the Sawtooth National Forest during the coming year.

VI. Targhee National Forest

A total of 12 hours and 20 minutes were required for the aerial survey of the Targhee National Forest. The aerial observation and ground appraisal survey show two areas of budworm damage, totalling 76,000 acres. Of this, there are approximately 11,000 acres of heavy defoliation; 35,000 acres of medium defoliation; and 30,000 acres of light defoliation. There were 66 sample plots containing 222 trees established on the forest. Ninety-seven percent of the trees were Douglas-fir; three percent, Engelmann spruce.

K. (see map) West Fork of Camas Creek.--45,000 acres. This area lies to the north of and borders the area sprayed in 1956. There are approximately 15,000 acres of medium defoliation and 30,000 acres of light defoliation. The infestation, apparently in its third year, extends to the northern border of the forest. Damage ranges from light to medium. In the Porcupine Pass area where medium defoliation was noted the infestation is rather sporadic.

L. Pleasant Valley.--31,000 acres. This area lies northwest of Spencer, Idaho and extends westward to Middle Creek. The main ridge of Pleasant Valley forms the north boundary and the area extends south to the forest boundary. Of this area approximately 11,000 acres are heavily infested, and the remaining area of 20,000 acres ranges from light to medium in its first year of significant defoliation. The heaviest concentration of budworm damage centers at the head of Cottonwood Creek and at the head of the West Fork of Indian Creek.

Table 2. 1956 Aerial Survey--flight hours and costs per national forest.

National Forest	Plane	No. of Flight Hours	Cost
Boise	Cessna 182	25 hrs., 50 min.	$ 820.20
Challis	"	14 hrs., 30 min.	460.38
Payette	"	14 " 15 "	452.44
Salmon	"	26 " 50 "	851.96
Sawtooth (N.Div.)	"	4 " 30 "	142.88
Targhee (W.Div.)	"	12 " 20 "	391.58
GRAND TOTAL		98 hrs., 15 min.	$3,119.44

Table 3. 1956 Appraisal Survey--sample plots, trees sampled, and tree species.

National Forest	No. of Plots	No. of Trees	o/o of trees by species			
			DF	WF	AF	ES
Boise	34	122	85	7	8	0
Challis	0	0	0	0	0	0
Payette	39	130	65	16	17	2
Salmon	18	54	100	0	0	0
Sawtooth (N.Div.)	25	80	95	0	0	5
Targhee (W.Div.)	66	222	97	0	0	3
TOTAL	182	608	88	5	5	2

Table 4. Areas, Acreages, and Degrees of Spruce Budworm Defoliation in Southern Idaho in 1956.

National Forest	Area	Degree of Defoliation			Forest Acreage
		Light	Medium	Heavy	
		Acres	Acres	Acres	
Boise	Indian Cr.			87,000	87,000
Challis	Lit. Soldier Mtn.		22,250		22,250
Payette	Big Creek			237,000	237,000
	Pony Creek		21,900		21,900
	Zena Creek		5,900		5,900
	Chicken Cr.	7,000			7,000
	Burnt Knob	13,400			13,400
	TOTAL	20,400	27,800	237,000	285,200
Salmon	Bernard Cr.		31,600		31,600
	Stoddard Cr. Pt.			37,200	37,200
	Square Top Mtn.	41,000			41,000
	TOTAL	41,000	31,600	37,200	109,800
Sawtooth	Boardman Cr.			17,700	17,700
	S. Fk. Boise Rv.	40,800			40,800
	Snowslide Cr.	10,400			10,400
	Five Points	2,500			2,500
	TOTAL	53,700		17,700	71,400
Targhee	W. Fk. Camas Cr.	30,000	15,000		45,000
	Pleasant Valley		20,000	11,000	31,000
	TOTAL	30,000	35,000	11,000	76,000
	GRAND TOTAL	145,100	116,650	389,900	651,650

REFERENCE

1. COLE, W. E. The spruce budworm in southern Idaho with special reference to surveys. Aug-Sept. 1955. Aerial and appraisal surveys. (Mimeo., IF&RES).

2. WASHBURN, R. I. Electronic recorder as aid in aerial insect surveys. Res. Note No. 31, May 1956. IF&RES.

U S DEPARTMENT OF AGRICULTURE
FOREST SERVICE

SAWTOOTH NATIONAL FOREST
NORTH DIVISION
IDAHO
BOISE MERIDIAN
1955*

SCALE

1956 SPRUCE BUDWORM SURVEY

SAMPLE PLOT LOCATION

M3 1956 SAMPLE PLOT

L-LIGHT	1-1ST YEAR
M-MEDIUM	2-2ND YEAR
H-HEAVY	3-3RD YEAR

AREAS OF DEFOLIATION

G-BOARDMAN CREEK	17,700 AC.
H-BOISE RV.-JOHNSON	40,800 AC.
I-SNOWSLIDE CREEK	10,400 AC.
J-FIVE POINTS	2,500 AC.
TOTAL	71,400 AC.

* REPRINT OF 1942 EDITION WITH BOUNDARY CHANGES TO MARCH 1, 1955

POLYCONIC PROJECTION
NORTH AMERICAN DATUM

115°30' 20' 10' 115°00' 50' 40' 114°30'

44°20'

R.9 E. R.10 E. R.11 E. R.12 E. R.13 E. R.14 E. R.15 E. R.16 E.

T.11 N. T.10 N. T.9 N. T.8 N. T.7 N. T.6 N. T.5 N. T.4 N. T.3 N. T.2 N. T.1 N. T.1 S.

44°00' 43°50' 43°40' 43°30' 43°20'

CHALLIS NATIONAL FOREST

SALMON NATIONAL FOREST

BOISE NATIONAL FOREST

SAWTOOTH NATIONAL FOREST

SOLDIER MOUNTAINS

WHITE CLOUD PEAKS

SALMON RIVER MOUNTAINS

BOISE BASIN

SAWTOOTH LAKE

STANLEY BASIN

CUSTER

Stanley

Basin Butte

McGowan Pk.

Copper Mtn.

Potato Mtn.

Elk Mtn.

Mt. Zummalt

Sawtooth Lake Observation

Mt. Regan

Thompson Pk.

Hoodoo Pk.

Baron Pk.

Braxon Pk.

Heyburn Mt.

Big Meadows

Freedom Flat

Howard Pk.

Mt. Cramer

Yellow Belly Lake

Payette Lake

Big Buck Mt.

Mt. Everly

Plummer Pk.

Snowyside Pk.

Parks Pk.

McDonald Pk.

Swanholm Pk.

Nannette Mtn.

Greylock Mtn.

Atlanta

Steal Mtn.

Bald Mtn.

Featherville

Jumbo Mtn.

Carrietown

Warwick Hot Springs

Soldier Base

Fairfield

Corral

Hill City

Packer Butte

Robinson Bar

Saturday Mt.

Castle Pk.

Galena Pk.

Silver Pk.

Boulder Pk.

Essley Pk.

Buttercup Mtn.

Shaw Mtn.

Norton Pk.

Newman

Mill Canyon

Vienna

Smoky Dome

Cold Spr.

Trinity

Red Mtn.

Grassy Mtn.

Graham Mtn.

Wolf Mtn.

Type Mtn.

Pinchot Pk.

Howard Pk.

Bell Roaring Lake

Blackman Pk.

Patterson Pk.

Washington Pk.

Champion Lake

Rainbow L.

Bowery Pk.

Glenns Ferry

Mt. Harrison

Mt. Harrison Lookout

Mt. Harrison Base

Robinson Bar

116°00′ 50′ 40′ 115°30′ 20′

R.3E. R.4E. R.5E. R.6E. R.7E R.8E. R.9E. R.10E.

T.26N. T.25N. T.24N. T.23N. T.22N. T.21N. T.20N. T.19N. T.18N. T.17N. T.16N. T.15N. T.14N.

45°30′ 20′ 10′ 45°00′ 50′ 45°40′

NEZPERCE NATIONAL

SALMON RIVER

CASCADE RESERVOIR

A1 A2 A3 A4 A5 A6 A7 H1 L2 L3 M3

Round Top Gospel Hump Buffalo Hump Slate Pt. Square Mtn. Umbrella Butte Sheep Mtn. Plummer Marten Hill Hanover Mtn. Marble Butte Concord Hump Concord Ridge Mineral Hill Shining Butte Lake Cr. Pt. Nut Hill Dixie Sinker Mtn. Churchill Mtn. Bat Rock Bat Pt. Rock Cr. Pt. Month Butte Elk Butte Quartzite Butte Oregon Butte Blowout Mtn. Rabbit Pt. Jerico Mtn. Black Butte Johnson Butte Mammoth Mtn. Sugarloaf Butte Mocasin Mtn. Cove Mtn. Topaz Pt. Kelly Mtn. Marshall Mtn. Republican Flats Burgdorf Warren Ruby Mtn. Squaw Pt. Lake Rock Diamond Rock Bruin Mtn. Pilot Pt. Black Tip Victor Pk. Storm Pk. Upper Payette L. Twenty Mile Cr. S. Loon Mtn. Slab Butte Granite Cr. Buckhorn Mtn. Williams Pk. Sawtooth Pk. Snowslide Fritsum Pk. Sawtooth Hill Shell Rock Pk. Pistol Rock Apple Mtn. Chilcoot Mtn. Thunderbolt Mtn. Cabin Pk. Buck Mtn. Warm Lake Resort Landmark Oro Mtn. Sulphur Mtn. Bald Mtn. Yellow Pine Golden Gate Pine Indian Pk. Smith Knob Mosquito Pk. Sleepy Cr. Quartz Pk. Stibnite Pk. Monumental Summit Murphy Pk. Mule Hill Sawtooth Ridge Pilgrim Mtn. Bernard Mtn. Blue Bunch Mtn. Lakeview Norwood Donnelly Roseberry Arling Cascade Lake Fork Lake York Lake Payette Lake Little Payette Lake McCall Meadows Elk Meadows Long Meadows Anchor Meadows Warren Meadows Burgdorf Meadows Jughandle Meadows Cougar Basin Red Top Meadow Moose Jaw Meadow Upper Raney Meadows Hida White Meadow Middle Meadow Crane Meadows Hang Meadow Rock Rabbit Meadow Meadow Cr. Meadows Indian Cr. Meadows Warren Airport Burgdorf Airport Cascade Airport Lake Fork Airport McCall Airport Little Payette Lake Airport Cascade Reservoir Lake York Lake Payette Lake Warm Lake Landmark Lake Fork Cougar Basin Jughandle Cougar Basin Lookout Lookout Cougar Basin Lookout Lookout Lookout

1956 SPRUCE BUDWORM SURVEY

BOISE, CHALLIS, PAYETTE, & SALMON N.F.

SAMPLE PLOT LOCATION

M3 1956 SAMPLE PLOT
L- LIGHT 1- 1ST YEAR
M- MEDIUM 2- 2ND YEAR
H- HEAVY 3- 3RD YEAR

UNIT II-E 1956 SPRUCE BUDWORM CONTROL PROJECT

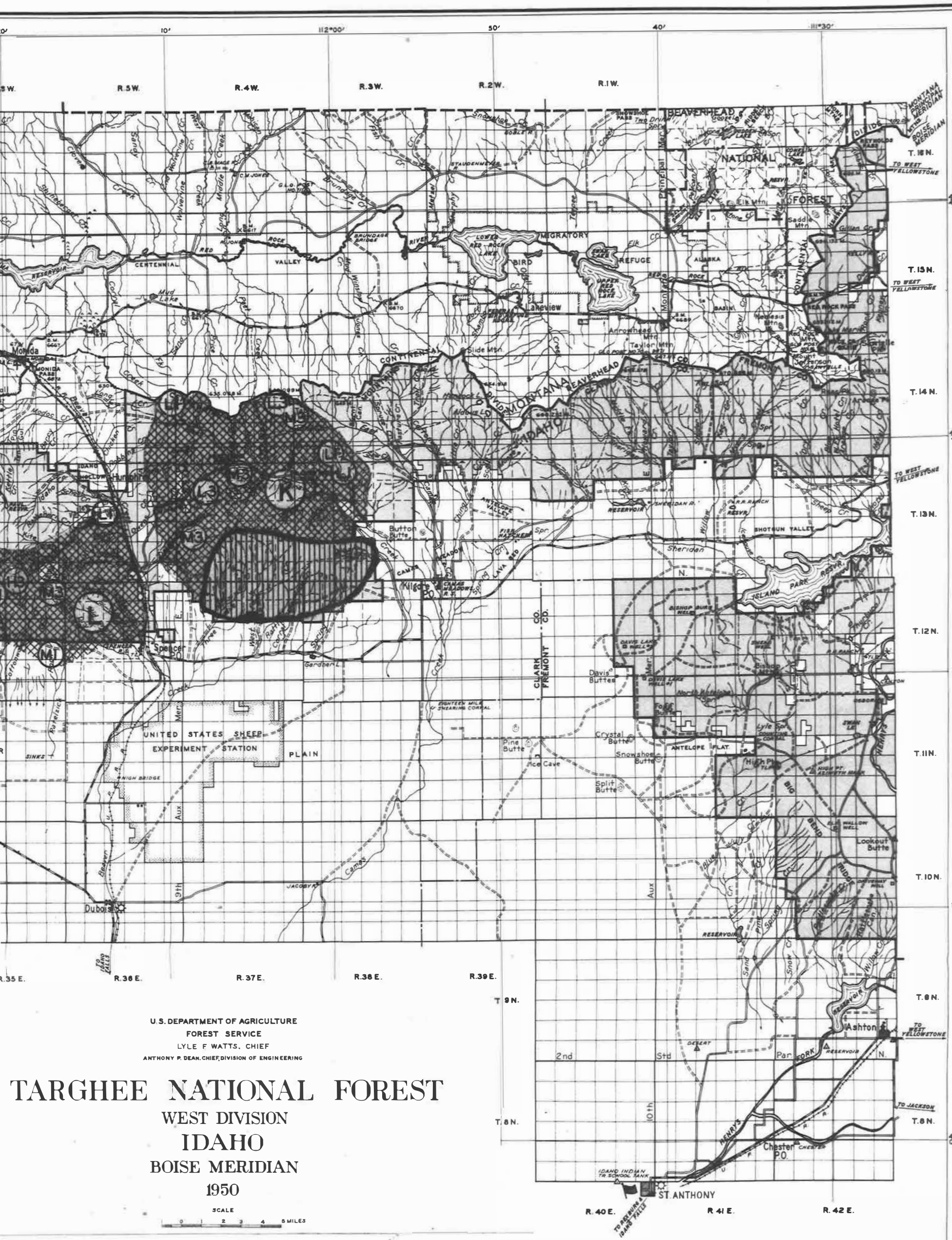
AREAS OF DEFOLIATION

ACRES OF HEAVY DEFOLIATION

A1 - BIG CREEK 1954 87,600 AC.
A2- BIG CREEK 1955 143,000 AC.
A3- BIG CREEK 1956 237,000 AC.
B-- INDIAN CREEK 87,000 AC.
C-- LIT. SOLDIER MTN. 22,250 AC.*
D-- BERNARD CREEK 31,600 AC.*
E-- STODDARD CR. PT. 37,200 AC.

TOTAL 415,050 AC.

*AREAS INCLUDED FOR ALL PRACTICAL PURPOSES



U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
LYLE F WATTS, CHIEF
ANTHONY P. DEAN, CHIEF, DIVISION OF ENGINEERING

TARGHEE NATIONAL FOREST

WEST DIVISION

IDAHO

BOISE MERIDIAN

1950

SCALE

0 1 2 3 4 5 MILES

1956 SPRUCE BUDWORM SURVEY

LE PLOT LOCATION
56 SAMPLE PLOT
K-TOO LIGHT TO RECORD
L-LIGHT 1-1ST YEAR
M-MEDIUM 2-2ND YEAR
H-HEAVY 3-3RD YEAR

ACRES OF DEFOLIATION
K- W. FK. CAMAS CR. 45,000AC.
L- PLEASANT VALLEY 31,000AC.
TOTAL 76,000AC.

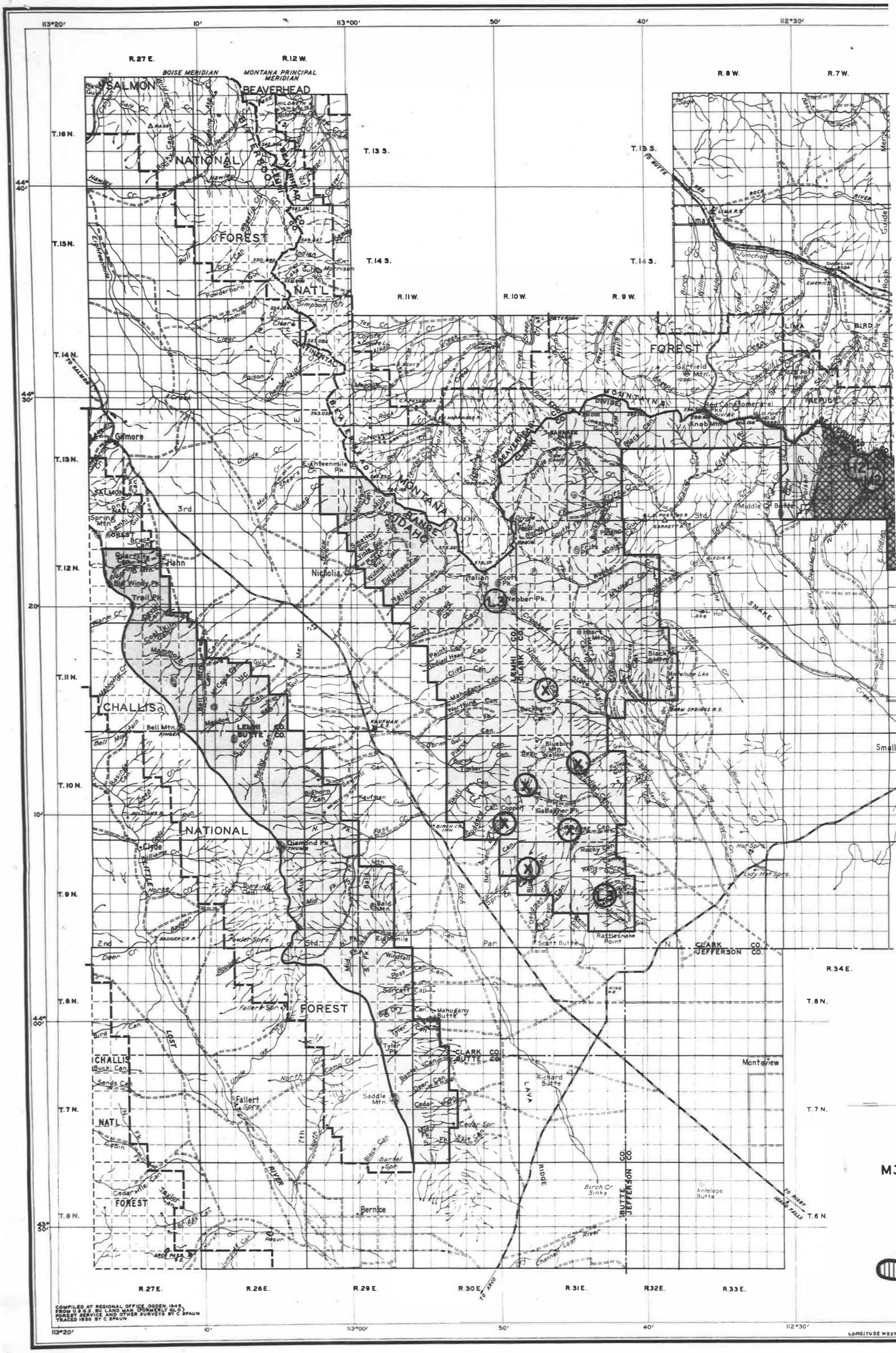
JNIT - 1956 SPRUCE BUDWORM CONTROL PROJECT

AREAS OF DEFOLIATION

TION: THE ACCURACY OF THIS MAP IS UNKNOWN, SINCE COMPILED FROM SOURCES OF UNKNOWN ACCURACY

POLYCONIC PROJECTION
1927 NORTH AMERICAN DATUM

AGRICULTURE - OGDEN


113°20'
10'
113°00'
50'
40'
112°30'
R.27 E.
R.12 W.
BOISE MERIDIAN
MONTANA PRINCIPAL MERIDIAN
R.8 W.
R.7 W.
SALMON
BEAVERHEAD
NATIONAL
FOREST
NAT'L
T.16 N.
T.15 N.
T.14 N.
T.13 N.
T.12 N.
T.11 N.
T.10 N.
T.9 N.
T.8 N.
T.7 N.
T.6 N.
T.13 S.
T.14 S.
R.11 W.
R.10 W.
R.9 W.
44° 40'
44° 30'
20'
10'
43° 50'
TO SALMON
TO BUTTE
Gilmore
Eighteenmile Pk.
Nicholia
Italian Pk.
Scott Pk.
Weber Pk.
Lima
Junction
Garfield Mtn.
Red Conglomerate Pks.
Knob Mtn.
Middle Butte
Lake Hol
Bluebird Mtn.
Gallagher Pk.
Rocky Can.
Scott Butte
Rattlesnake Point
CLARK CO.
JEFFERSON CO.
R.34 E.
CHALLIS
Bell Mtn.
Diamond Pk.
Fallert Spr.
Saddle Mtn.
Bernice
Cedar Spr.
Barkel Spr.
Richard Butte
Antelope Butte
Birch Cr. Sinks
Monteview
LAVA RIDGE
BUTTE CO.
JEFFERSON CO.
TO ARCO
TO IDAHO FALLS
TO RIGBY
R.27 E.
R.28 E.
R.29 E.
R.30 E.
R.31 E.
R.32 E.
R.33 E.
COMPILED AT REGIONAL OFFICE, OGDEN, 1948,
FROM U.S.G.S. (BU LAND MAN. (FORMERLY GLO.)
FOREST SERVICE AND OTHER SURVEYS BY C. SPAUN
TRACED 1950 BY C. SPAUN
LONGITUDE WEST